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Recombinant FtsZ Proteins from Mollicutes Interact with Escherichia coli Division Machinery

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Abstract

© 2016, Springer Science+Business Media New York.FtsZ is a well-known prokaryotic tubulin homologue. It participates in cytokinesis in most bacteria and is considered to be a key division protein. However, the genomes of some mycoplasma species (class Mollicutes) lack of the ftsZ genes or even ftsZ-like genes. Moreover, it was demonstrated for Mycoplasma mycoides and Mycoplasma genitalium that FtsZ protein is not essential for division and survival. In this study, we induced an expression of recombinant FtsZ proteins from Mollicutes Acholeplasma laidlawii and Mycoplasma gallisepticum in Escherichia coli cells in the background of normal expression of its own FtsZ. By using indirect double immunofluorescence in combination with single-molecule localization microscopy, it was demonstrated that both mycoplasmal FtsZ proteins are able to interfere with E. coli division machinery, but the interaction differs depending on the protein used. Our data suggest that FtsZ proteins from Mollicutes may play an important role in the cell division of corresponding mycoplasmas.

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Keywords

Cell division, Escherichia coli, FtsZ, Mycoplasma